

A Checklist of Parasites of *Peromyscus maniculatus* in North America

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Abstract

This document represents a summary of parasites, in the broadest sense of the term, reported from *Peromyscus maniculatus* from throughout its range in North America. The document provides data from work ranging from paleontological findings to relatively current reports of parasites and parasitism from *P. maniculatus* and covers viruses, bacteria *sensu lato*, protists, helminths, and ectoparasites.

Keywords: parasites, *Peromyscus maniculatus*, virus, bacteria, ectoparasite, helminth parasite, protista, protozoa

Peromyscus maniculatus is a species of rodent, commonly known as the deer mouse, that belongs to the family Muridae Killiger, 1811. McKenna and Bell (1997) report that *P. maniculatus* belongs in the following classification:

Family Muridae Killiger, 1811
 Subfamily Sigmodontinae Wagner, 1843
 Tribe Peromyscini Hershkovitz 1966
 Genus *Peromyscus* Gloger, 1841

Hibbard (1968) reports on the paleontology of *P. maniculatus* and cites the findings of Peterson (1926); Tamsitt (1957); Guilday (1962); Slaughter and Ritchie (1963); Guilday, Martin, and McCrady (1964); and Dalquest (1965). The oldest record is that of Slaughter and Ritchie with a Wisconsin ¹⁴C age of 28,000 ± 4,740 BP years.

Peromyscus maniculatus is found throughout North America, from alpine regions to desert areas, from Alaska to central Mexico. The rodents are capable of living in every habitat in New Mexico but are most common in northern sage-grassland habitats. They are much less common in woodland, grassland, or desert communities. In southern New Mexico, the woodlands act as a barrier between low-

land and mountain populations. In contrast, the mountain and lowland populations are in continuous contact throughout the woodland areas in northern New Mexico.

O'Farrell (1975) reported greater trapping success of deer mice at higher elevations, where they have a preference for more mesic *Artemisia/Agropyron* associations, with perennial grasses providing a source of succulent herbage as well as excellent cover and numerous additional habitats for insects. Richard (1960) found that deer mice became less abundant in the drier *Artemisia/Poa* habitats.

Populations of deer mice tend to be high but fluctuate throughout the year, with a peak in late summer or fall and a low in late winter. Gestation is from 21 to 28 days, and a litter varies from 1 to 10 with an average of 3 or 4 offspring. Weaning time is usually 25 to 35 days, and young mice become independent on average at 35 days. The average age of sexual maturity is 49 days. Holdenried and Morlan (1956) reported that pregnant mice in Santa Fe County, New Mexico, were encountered from December through September.

The mice are primarily nocturnal and spend their time on the ground within home ranges varying anywhere from 240 square meters to 3,000 square meters. They are om-

nivorous, consuming insects as well as seeds, fruit, flowers, and nuts (Jameson, 1952). Hamilton (1941) found some arthropods in the diet of deer mice in the eastern United States, and Whitaker Jr. (1966) also found arthropods in the diet of deer mice in Indiana. Koehler and Anderson (1991) found that this rodent relies heavily on arthropods for food during the months of April, June, and August in southern Idaho with lepidopteran larvae and carabid beetles occurring more frequently in their diets.

Numerous studies have provided evidence for territoriality or home ranges for *Peromyscus* (e.g., Burt, 1940; Nicholson, 1941; Redman and Sealander, 1958; Terman, 1961; Myton, 1974; Metzgar, 1971, 1973a, 1973b, 1979; Madison, 1977; Wolff, 1985a,b). According to Noble (1939), territories of *Peromyscus* are areas that are defended, whereas a home range is not. Territorial defense more likely occurs at high population densities rather than low. Sizes of home ranges or territories range from 790 to 3,000 square meters, and the variation is likely a function of habitat, food, and population density. Home ranges or territories are smaller in bushy, favorable habitats than in more open, less favorable habitats (Metzgar, 1971; Van Horne, 1982). Wolff (1985b) found that food does not appear to be the major factor that determines minimum size of home range, but males had slightly larger home ranges than females. Territoriality in *Peromyscus* appears to be the result of reproductive competition and not of defense of food (Nadeau et al., 1981; Wolff, 1985a,b). Males appear to be territorial to provide exclusive reproductive access to one or more females, whereas females probably defend a space to rear their young (Wolff and Lundy, 1985) or to prevent infanticide (Wolff, 1985b, 1993).

Articles about the parasites of *Peromyscus* species have been written by several authors. A review of the parasites of *Peromyscus* species has been written by Whitaker Jr. (1968), and King (1968) edited a special publication (no. 2) on the biology of *Peromyscus* (Rodentia). In this book, Whitaker Jr. wrote the chapter on parasites. Lichtenfels's (1966) thesis, written at the University of Maryland, reported on a survey of intestinal nematodes from Maryland rodents. Harkema (1936) wrote a monograph on the parasites of some North Carolina rodents. Hall (1916) wrote a monograph on the nematodes of Rodentia, Lagomorpha, and Hyracoidea. Doran (1954a,b, 1955a,b) presented the geographical distribution records of the protozoa and helminths of *P. maniculatus* in North America. Dyer (1969) provided a checklist of the protozoa and helminths of *P. maniculatus*. Mayberry et al. (2000) published a bibliography of parasites of vertebrate hosts in Arizona, New Mexico, and Texas that contains several references to parasites of *Peromyscus maniculatus*. Padovan (2006) summarized viral, bacterial, and fungal diseases associated with this species.

Because of its high population density and wide distribution, the deer mouse is considered responsible for distributing its parasites to other animals, especially other rodents, in all habitats and locations, as reported by Grundmann and Frandsen (1960).

Parasites

Viruses

Adenovirus (Adenoviridae) from Kern County, California, by Reeves et al. (1967), Hardy et al. (1974).

Buttonwillow virus (Bunyaviridae) from Kern County, California, by Taylor (1967, pp. 633–636) and Hardy et al. (1970).

Colorado tick fever virus (Reoviridae): experimental infection by Taylor (1967, pp 369–372) and Bowen et al. (1981a); natural infection reported by Taylor (1967), Burgdorfer (1960), Burgdorfer and Eklund (1960), Emmons (1988), Johnson (1970), Simpson (1968), Seymour and Yuill (1981), Bowen et al. (1981b), McLean et al. (1989), Clark et al. (1970), and Lane et al. (1982).

Hepatitis E virus (Hepesviridae) by Favorov et al. (2000).

Kobuvirus (Picornaviridae) by Phan et al. (2011).

Modoc virus (Flaviviridae) by Taylor (1967, pp 357–360) from Modoc County, California; Karabatsos (1985) and Hardy et al. (1974) from Kern County, California; Zarnke and Yuill (1985) from Alberta, Canada. Experimental infection by Davis et al. (1974) and Hume et al. (2015).

Monogahela virus (Bunyaviridae, Hantaviruses) by Song et al. (1996) and Monroe et al. (1999) in the eastern United States.

Mouse papillomavirus PmPV1 (Papillomaviridae) by Phan et al. (2011).

Powassan virus (Flaviviridae) by Taylor (1967, pp. 449–452) from the Black Hills, South Dakota; McDonald et al. (2009) from Alaska; Deardorff et al. (2013) from the southwestern US; Hardy et al. (1974) from California; Seymour and Yuill (1981).

Rodent adeno-associated virus (Parvoviridae) by Phan et al. (2011).

Rodent hepatic virus (Flaviviridae) by Kapoor et al. (2013).

Rodent stool-associated circular viruses RodSCV (Circoviridae) by Phan et al. (2011).

Saint Louis encephalitis virus (Flaviviridae) reported by Whitney et al. (1968) and by Seymour and Yuill (1981) based on serological diagnostic tests.

Sin Nombre virus (Bunyaviridae, Hantaviruses). Formerly known as Hantavirus Pulmonary Syndrome virus, Four Corners virus, Muerto Canyon virus, and Convict Creek virus. First reported by Nichol et al. (1993) from the

southwestern US. Additional report by Childs et al. (1994) in the southwestern United States; Elliot et al. (1994), Nerurkar et al. (1994), and Schmaljohn et al. (1994) in California; Graham and Chomel (1997) in California; Bennett et al. (1999) in California; Calisher et al. (1999) in Colorado; Feuer et al. (1999) in California and Nevada; Monroe et al. (1999) in the western US and Canada; Root et al. (1999) in Colorado; Boone et al. (2000) in California and Nevada; Drebot et al. (2001) in Canada; Glass et al. (2002) in the southwestern US; Kuenzi et al. (2005) in Montana; Douglas et al. (2007) in Montana; Madhav et al. (2007) in Montana; Safronetz et al. (2008) in Manitoba, Canada; Clay et al. (2009) in Utah; Disney et al. (2010) in Oregon; Carver et al. (2011) in Montana; Amman et al. (2013) in Colorado; and Danforth et al. (2020) in California.

Venezuelan equine encephalitis virus (Togaviridae) reported by Scherer et al. (1971), Sudia and Newhouse (1975), and Seymour and Yuill (1981) based on serological diagnostic tests.

Western equine encephalitis virus (Togaviridae) by Bowers et al. (1969) and Hardy et al. (1974).

Whitewater Arroyo virus (Arenaviridae). Woodrats (*Neotoma*) are regarded as the main reservoir of this virus. Bennett et al. (2000) used serological tests and found *P. maniculatus* blood to be reactive to this type of virus.

Bacteria

Anaplasma (Ehrlichia) phagocytophilum by Zeidner et al. (2000), DeNatale et al. (2002), and Larson et al. (2018).

Bartonella sp. by Tyzzer (1942), Kosoy et al. (1997), Jardine et al. (2005), Bai et al. (2011), and Goodrich et al. (2020).

Borrelia bissettii by Schneider et al. (2000), Burkot et al. (2000, 2001), DeNatale et al. (2002), Eisen et al. (2003, 2009), and Vredevoe et al. (2004).

Borrelia burgdorferi by Steere (1989), Rand et al. (1993), Ubico et al. (1996), Burkot et al. (1999), Zeidner et al. (2000), Oliver et al. (2006), Morshed et al. (2015), Larson et al. (2018), Buchholz et al. (2018), and Rodríguez-Rojas et al. (2020).

Coxiella burnetii by Stoenner et al. (1959), Marchette et al. (1962a), Vest et al. (1965), Enright et al. (1969, 1971a,b), and Thompson et al. (2012).

Francisella tularensis by Burroughs et al. (1945), Holdenried and Quan (1956), Vest and Marchette (1958), and Wobeser et al. (2007, 2009).

Leptospira sp. by Ferris et al. (1959), Redetzke and McCann (1980), and Verma et al. (2019).

Pasteurella multocida by Quan et al. (1979), but Swanekamp (2005) did not find it.

Rickettsia akari by Bennett et al. (2007).

Rickettsia rickettsii, causative agent of the Rocky Mountain Spotted Fever (RMSF), by Lundgren and Thorpe (1966) and Adjemian et al. (2008).

Yersenia pestis by Pollitzer and Meyer (1961), Kartman et al. (1962), Marchette et al. (1962b,c), Quan and Kartman (1962), Hudson et al. (1964, 1972), Hubbert et al. (1966), Hudson and Quan (1975), Nelson and Smith (1976), Twigg (1978), Barnes (1982), Poland et al. (1994), Davis et al. (2002), Nieto et al. (2007), Stapp et al. (2008), and Danforth et al. (2018). Experimental infection by Holdenried and Quan (1956) and Bacon and Drake (1958).

Fungi

Anthroderma benhamiae by Hubálek (2000).

Anthroderma persicolor by Hubálek (2000).

Anthroderma quadrifidum by Hubálek (2000).

Anthroderma silverae by Vanderwolf et al. (2018).

Coccidioides sp. by Catalán-Dibene et al. (2014), del Rocío Reyes-Montes (2016).

Emmonsia parva var. crescens is a saprotrophic filamentous fungus associated with decaying plant material, but occasionally it can cause lung infection and disease. It appears that lung disease and pathology is caused by immune reaction to spores (Sigler, 2005), and this species is not a truly parasitic organism. Reported by Bakerspiegel (1956), Carmichael (1961), Dvorak et al. (1965), Jellison (1971). Spores reported in lung tissue by Bartlow (2019).

Microsporium versicolor by English et al. (1978), Hubálek and Rudolf (2011).

Trichophyton sp. by Carmichael (1961), Vanderwolf et al. (2018).

Protozoans

Besnoitia jellisoni from upper Salmon River, Idaho, by Frenkel and Lunde (1966).

Eimeria arizonensis from Oregon by Fuller (1996), from British Columbia by Levine and Ivens (1963), from New Mexico by Reduker et al. (1985).

Eimeria delicata from Oregon by Fuller (1996), from New Mexico by Reduker et al. (1985).

Eimeria peromysci from San Bernardino County, California, by Reduker et al. (1985); from New Mexico by Reduker et al. (1987).

Eimeria siniffi from British Columbia by Levine and Ivens (1963).

Giardia microti from California by Kofoed and Christiansen (1915a).

Giardia muris from California by Kofoed and Christiansen (1915b), Boeck and Stiles (1923).

Giardia peromysci from Ontario, Canada, by Grant and Woo (1979).
Grahamella sp. from Utah by Frandsen and Grundmann (1961b), from California by Wood (1975).
Haemobartonella sp. from California by Wood (1975).
Hepatozoon leptosoma from California by Wood (1962, 1975).
Isoospora californica from White Sands National Monument, New Mexico, by Mayberry et al. (1980).
Isoospora peromysci from northeastern Colorado and Ft. Collins, Colorado, by Duszynski and Anderson (1968); from California by Davis (1967).
Klossia perplexens from Illinois by Levine et al. (1955).
Sarcocystis idahoensis by Bledsoe (1979), Dubey (1983).
Sarcocystis peromysci by Dubey (1983).
Sarcocystis sp. from Benton County, Washington, by O'Farrell (1975).
Trichomonas muris from California by Kofoed and Christiansen (1915b), as cited by Doran (1955b).
Trypanosoma brucei experimental infection by Packchanian (1934).
Trypanosoma cruzi experimental infection by Wood (1934).
Trypanosoma peromysci from Alberta, Canada, by Watson and Hadwen (1912); from New Mexico, Arizona, and California by Wood (1942, 1952, 1975).
Trypanosoma sp. from Utah by Frandsen and Grundmann (1961b).

Arthropoda—Acari or mites acarines (Acarina)

Androlaelaps casalis by Allred (1957c), Allred and Beck (1966), Allred (1970), Whitaker and Maser (1985).
Androlaelaps debilis by Glicken and Schwab (1980).
Androlaelaps fahrenheitsi (synonym of *Androlaelaps glasgowi*) by Allred (1957c, 1958), Allred and Beck (1966), Allred and Goates (1964), Douglas (1969), Elzinga and Rees (1964), Glicken and Schwab (1980), Hansen (1964), Keegan (1953), Lawrence et al. (1965), Rapp (1962), Reeves et al. (2007), Scholten et al. (1962), Storm and Ritzi (2008), Whitaker and Corthum (1967), Whitaker et al. (1975), Whitaker and Maser (1985), Wyman and Schaefer (1972), Howell et al. (2016).
Androlaelaps leviculus by Allred (1957c), Allred (1958).
 Allred and Beck (1966), Keegan (1951), Keegan (1956).
 Anoetidae sp. by Whitaker and Maser (1985).
 Antennophorid sp. by Allred (1957c).
 Ascaidae sp. by Allred (1957c).
Bdellonyssus bacoti from Ft. Hood, Texas, by Hedeon (1953).
Brevisterna morlani by Strandtmann and Allred (1956).
Brevisterna utahensis by Strandtmann and Allred (1956), Allred (1957c), Allred and Beck (1966).
 Camisiidae sp. by Allred (1957c).
 Cheyletidae sp. by Allred (1957c).

Cyrtolaelaps sp. by Whitaker and Maser (1985).
Dermacarus hypudaei by McDaniel (1979), Rupes and Whitaker Jr. (1968), Whitaker et al. (1975).
Dermacarus jonesi by Fain and Whitaker Jr. (1976).
Dermacarus newyorkensis by Fain et al. (1971).
Dermanyssus becki by Allred (1957c), Allred and Beck (1966).
 Eremaeidae sp. by Allred (1957c).
Eubrachylaelaps circularis by Allred (1957c), Allred and Beck (1966), Furman (1955), Jameson Jr. and Brennan (1957), Whitaker and Maser (1985).
Eubrachylaelaps debilis by Allred (1957c), Allred and Beck (1966), Jameson Jr. and Brennan (1957), Keegan (1953), Whitaker and Maser (1985).
Eubrachylaelaps hollisteri by Allred (1957c), Allred and Beck (1966).
Eulaelaps sp. by Allred (1957c).
Eulaelaps stabularis by Allred and Beck (1966), Hansen (1964), Lawrence et al. (1965), Whitaker Jr. and Wilson (1968), Whitaker et al. (1975), Whitaker and Maser (1985).
Euryparasitus sp. by Whitaker and Maser (1985).
 Gamasolaelaptidae sp. by Allred (1957c).
Garmania sp. by Allred (1957c).
Glycyphagus hypudaei by Whitaker and Maser (1985), Reeves et al. (2007), Storm and Ritzi (2008).
Glycyphagus sp. by Allred (1957c).
Haemogamasus ambulans by Allred (1957c), Allred and Beck (1966), Keegan (1951), Wyman and Schaefer (1972).
Haemogamasus liponyssoides by Keegan (1951), Lawrence et al. (1965), Storm and Ritzi (2008).
Haemogamasus longitarsus by Allred (1957c), Allred and Beck (1966).
Haemogamasus nidi by Allred (1957c), Allred and Beck (1966), Hansen (1964).
Haemogamasus pontiger by Allred (1957c), Allred and Beck (1966).
Haemogamasus reidi by Whitaker and Maser (1985).
Haemogamasus sp. by Allred (1957c).
Hirstionyssus blarinae by Storm and Ritzi (2008), cited as *Echinonyssus blarinae*.
Hirstionyssus carnifex by Keegan (1953).
Hirstionyssus cynomys by Rapp (1962).
Hirstionyssus geomydis by Allred (1957c).
Hirstionyssus hilli by Allred (1957c), Allred and Beck (1966), Herrin (1970), Keegan (1953).
Hirstionyssus incomptis by Allred (1957c), Allred and Beck (1966), Elzinga and Rees (1964), Herrin (1970).
Hirstionyssus isabellinus by Allred (1957c), Allred and Beck (1966).
Hirstionyssus neotomae by Allred and Beck (1966).

- Hirstionyssus obsoletus* by Allred (1957c), Jameson (1950), and by Whitaker and Maser (1985), cited as *Echinonyssus obsoletus*.
- Hirstionyssus occidentalis* by Elzinga and Rees (1964), Hansen (1964), Herrin (1970), Strandtmann and Morlan (1953).
- Hirstionyssus punctatus* by Allred and Beck (1966).
- Hirstionyssus* sp. by, and perhaps species "p," Scholten et al. (1962) and Johnson and Brennan (1957).
- Hirstionyssus talpae* by Hansen (1964), Whitaker Jr. and Wilson (1968).
- Hirstionyssus tarsalis* by Allred and Beck (1966).
- Hirstionyssus triacanthus* by Allred and Beck (1966).
- Hirstionyssus utahensis* by Allred and Beck (1966), Glicken and Schwab (1980), Herrin (1970), Whitaker et al. (1975). By Storm and Ritzi (2008), Whitaker and Maser (1985), cited as *Echinonyssus utahensis*.
- Hypoaspis lubrica* by Allred (1957c), Allred and Beck (1966), Storm and Ritzi (2008).
- Hypoaspis miles* by Allred (1957c), Allred and Beck (1966).
- Hypoaspis* sp. by Allred (1957c), Whitaker et al. (1975).
- Ischyropoda armatus* by Allred (1957c), Allred and Beck (1966), Keegan (1951).
- Ischylopoda furmani* by Allred (1965), Allred and Beck (1966), Keegan (1956).
- Klemania* sp. by Allred (1957c), Allred and Goats (1964), Whitaker Jr. and Wilson (1968).
- Labidophoridae sp. by Scholten et al. (1962).
- Laelaps incilis* by Allred and Beck (1966).
- Laelaps kochi* by Whitaker Jr. and Wilson (1968), Whitaker and Maser (1985).
- Laelaps nuttalli* by Allred (1957c), Allred and Beck (1966), Ulrich and Vaughn (1963).
- Listrophorus* sp. by Allred (1957c), Allred and Beck (1966).
- Macrocheles* sp. by Allred and Beck (1966), Hansen (1964).
- Macrochelidae sp. By Whitaker Jr. and Wilson (1968).
- Myobia musculi* by McDaniel (1979), Storm and Ritzi (2008), Ulrich and Vaughn (1963).
- Myobiidae sp. by Scholten et al. (1962).
- Myocoptes japonensis* by Storm and Ritzi (2008), Whitaker et al. (1975).
- Myocoptes musculus* by McDaniel (1979), Reeves et al. (2007), Storm and Ritzi (2008).
- Myocoptes* sp. by Allred and Beck (1966), Elzinga and Rees (1964).
- Neoparasitidae sp. by Allred (1957).
- Ondatra laelaps multispinosus* by Allred (1957c), Allred and Beck (1966).
- Ornithonyssus bacoti* by Allred (1957c), Allred and Beck (1966), Connior et al. (2017), Whitaker Jr. and Wilson (1968).
- Ornithonyssus* sp. by Allred (1957c).
- Orycterovenus soricis* by Storm and Ritzi (2008).
- Pachylaelapidae sp. by Allred (1957c).
- Parasitidae sp. by Allred (1957c).
- Phytoseiidae sp. by Allred (1957c).
- Poecilochiridae sp. by Whitaker Jr. and Wilson (1968).
- Poecilochirus* sp. by Allred (1957c), Hansen (1964).
- Proctolaelaps* sp. by Whitaker and Maser (1985).
- Protomyobia clapparedei* by Whitaker et al. (1975).
- Psorergates peromysci* by Giesen et al. (1983).
- Psorergates watsoni* by Kok et al. (1971).
- Pyemotidae sp. by Allred (1957c).
- Pygmephorus* sp. by Hansen (1964).
- Radfordia affinis* by Whitaker Jr. and Wilson (1968).
- Radfordia bachai* by Howell and Elzinga (1962).
- Radfordia lemnina* by Allred (1957c), Allred and Beck (1966).
- Radfordia subuliger* by Allred (1957c), Allred and Beck (1966), Elzinga and Rees (1964), Fain and Bochkov (2002), Reeves et al. (2007), Spencer (1940), Storm and Ritzi (2008), Whitaker Jr. and Wilson (1968), Whitaker et al. (1975).
- Resinacarus* sp. by Whitaker Jr. and Wilson (1968).
- Rhizoglyphus echinopus* by Allred (1957c).
- Tetranychidae sp. by Allred (1957c).
- Trichoecius tenax* by Storm and Ritzi (2008).
- Typhlodromus mariposus* by Allred (1957c).
- Uropodidae sp. by Allred (1957c).
- Acarina—Trombiculidae**
- Chatia ochotona* by Allred (1957c), Allred and Beck (1966), Brennan and Beck (1955), Gould (1956), Traub and Nadchatram (1966).
- Chatia setosa* by Allred (1957c), Brennan (1946), Brennan and Beck (1955), Easton (1975), Gould (1956), Jameson Jr. and Brennan (1957), Traub and Nadchatram (1966).
- Cheladonta micheneri* by Loomis (1956).
- Comatacarus inconspicuus* by Reed (1973).
- Comatacarus pusillus* by Goff and Loomis (1974).
- Euschoengastia ambocalis* by Wrenn and Loomis (1973).
- Euschoengastia californica* by Gould (1956), Loomis and Bunnell (1962).
- Euschoengastia cordiremus* by Allred and Beck (1966), Allred and Goates (1964), Brennan (1948), Brennan and Beck (1955), Gould (1956).
- Euschoengastia crateris* by Farrell (1956).
- Euschoengastia criceticola* by Allred (1957c), Allred and Beck (1966), Allred and Goates (1964), Brennan (1948), Brennan and Beck (1955), Brennan and Jones (1954), Brown and Brennan (1952), Douglas (1969), Elzinga and Rees (1964), Gould (1956), Jameson and Brennan (1957).
- Euschoengastia decipiens* by Allred and Beck (1966), Brennan and Beck (1955).
- Euschoengastia diverse* by Loomis (1956).
- Euschoengastia frondifera* by Gould (1956).

- Euschoengastia jamesoni* by Whitaker et al. (1975)
- Euschoengastia jonesi* by Lipovsky and Loomis (1954), Loomis (1956)
- Euschoengastia lacerta* by Gould (1956)
- Euschoengastia lanei* by Allred and Beck (1966), Allred and Goates (1964), Douglas (1969).
- Euschoengastia luteodema* by Allred and Beck (1966), Brennan and Beck (1955).
- Euschoengastia obesa* by Allred and Beck (1966), Brennan and Beck (1955).
- Euschoengastia oregonensis* by Allred and Beck (1966), Brennan and Beck (1955), Easton (1975).
- Euschoengastia peromysci* by Brennan and Jones (1954), Douglas (1969), Farrell (1956), Gould (1956), Jameson Jr. and Brennan (1957), Loomis (1956), Reeves et al. (2007), Storm and Ritzi (2008), Whitaker et al. (1975).
- Euschoengastia pomerantzi* by Allred and Beck (1966), Gould (1956).
- Euschoengastia radfordi* by Allred and Beck (1966), Brennan and Jones (1954), Elzinga and Rees (1964), Gould (1956), Jameson Jr. and Brennan (1957).
- Euschoengastia rotunda* by Allred and Beck (1966).
- Euschoengastia sciuricola* by Allred (1957c), Allred and Beck (1966), Gould (1956), Jameson Jr. and Brennan (1957).
- Euschoengastia setosa* by Lawrence et al. (1965), Loomis (1956), Reeves et al. (2007), Whitaker et al. (1975).
- Euschoengastia trigenuala* by Loomis (1956).
- Euschoengastia velata* by Easton (1975).
- Euschoengastoides hoplai* by Brennan and Jones (1954), Gould (1956).
- Euschoengastoides loomisi* by Crossley and Lipovsky (1954), Loomis (1956).
- Euschoengastoides neotomae* by Loomis (1971).
- Eutrombicula alfreddugesi* by Loomis (1956), Wolfenbarger (1952).
- Eutrombicula lipovskyana* by Loomis (1956).
- Fonsecia gurneyi* by Loomis (1955, 1956).
- Fonsecia kansasensis* by Loomis (1955, 1956).
- Hyponeocula arenicola* by Tanigoshi and Loomis (1974).
- Leeuwenhoekia americana* by Allred and Beck (1966), Gould (1956), Loomis (1956). Reed (1973) revised the genus and cites this species as *Comatacarus americanus*.
- Leeuwenhoekia dolosa* by Gould (1956), Jameson and Brennan (1957). Reed (1973) revised the genus and cites this species as *Comatacarus dolosus*.
- Leeuwenhoekia (Comatacarus) americanus* by Douglas (1969), Easton (1975).
- Leptotrombidium myotis* by Allred (1957c), Allred and Beck (1966), Lawrence et al. (1965).
- Leptotrombidium panamensis* by Allred and Beck (1966).
- Microtrombicula crossleyi* by Loomis (1954), Vercammen-Grandjean (1965).
- Microtrombicula nasalis* by Webb and Loomis (1970).
- Microtrombicula ornata* by Loomis (1956), Loomis and Lipovsky (1954), Webb and Loomis (1970).
- Miyatrombicula esoensis* by Allred (1957c), Allred and Beck (1966).
- Miyatrombicula scottae* by Brennan and Jones (1954), Gould (1956).
- Miyatrombicula* sp. by Lawrence et al. (1965).
- Neotrombicula brennani* by Easton (1975).
- Neotrombicula browni* by Brennan and Wharton (1950), Kardos (1954).
- Neotrombicula californica* by Allred (1957c), Allred and Beck (1956), Brennan and Beck (1955), Brennan and Wharton (1950), Gould (1956).
- Neotrombicula cavicola* by Brennan and Wharton (1950), Gould (1956).
- Neotrombicula carterae* by Withaker et al. (1975).
- Neotrombicula dinehartae* by Brennan and Jones (1954), Brennan and Wharton (1950), Gould (1956).
- Neotrombicula harperi* by Allred (1957c), Allred and Beck (1966), Brennan and Wharton (1950), Kardos (1954), Lawrence et al. (1965).
- Neotrombicula jewetti* by Allred (1957c), Allred and Beck (1966), Brennan and Jones (1954), Brennan and Wharton (1950), Gould (1956), Jameson Jr. and Brennan (1957).
- Neotrombicula lipovskyi* by Kardos (1954), Loomis (1956).
- Neotrombicula loomisi* by Kardos (1954), by Douglas (1969) as *Trombicula loomisi*.
- Neotrombicula microti* by Allred (1957c), Brennan and Wharton (1950), Brown and Brennan (1952), Jameson Jr. and Brennan (1957).
- Neotrombicula sylvilagi* by Kardos (1954), Loomis (1956).
- Neotrombicula whartoni* by Kardos (1954).
- Odontacarus dentatus* by Goff et al. (1972), used as a senior synonym of *O. galli*.
- Odontacarus galli* by Greenberg (1952), Loomis (1956).
- Odontacarus hirsutus* by Jameson Jr. and Brennan (1957).
- Odontacarus linsdalei* by Allred and Beck (1966), Allred and Goates (1964).
- Odontacarus villosus* by Goff and Loomis (1973).
- Pseudoschoengastia farneri* by Lipovsky (1951a), Loomis (1956).
- Pseudoschoengastia hungerfordi* by Lipovsky (1951a, 1951b), Loomis (1956).
- Pseudoschoengastia occidentalis* by Loomis and Bunnell (1962).
- Trombicula arenicolor* by Allred and Beck (1966), Brennan and Beck (1955), Elzinga and Rees (1964).
- Trombicula bakeri* by Allred and Beck (1966).
- Trombicula montanensis* by Allred (1957c), Allred and Beck (1966).
- Xenodontacarus plumosus* by Loomis and Goff (1973); by Greenberg (1951) and Loomis (1956), cited as *Odontacarus plumosus*.

Anoplura

Hoplopleura acanthopus by Augustson (1941), Hansen (1964), Lawrence et al. (1965).

Hoplopleura erratica by Lawrence et al. (1965).

Hoplopleura hesperomydis from California by Ferris (1921), Augustson (1941), Cook (1959), Elzinga and Rees (1964), Ferris (1916), Glicken and Schwab (1980), Hansen (1961), Kellogg and Ferris (1915), Kim (1965), Kim et al. (1966), Lawrence et al. (1965), Morlan and Hoff (1957), Reeves et al. (2007), Scanlon (1960), Scholten et al. (1962), Spencer (1966), Storm and Ritzi (2008), Whitaker et al. (1975), Wilson (1961), Wyman and Schaefer (1972), Zwolak et al. (2013).

Hoplopleura sciuricola by Lawrence et al. (1965).

Neohaematopinus laevisculus by Augustson (1941).

Polyplax auricularis by Augustson (1941), Beer et al. (1959), Morlan and Hoff (1957), Elzinga and Rees (1964), Emerson (1971), Ferris (1916, 1951), Hansen (1964), Kellogg and Ferris (1915, 1916), Reeves et al. (2007), Scanlon (1960), Spencer (1966), Whitaker et al. (1975), Zwolak et al. (2013).

Polyplax serrata by Ulrich and Vaughn (1963).

Ticks

Amblyomma maculatum by Semtner and Hair (1973).

Dermacentor andersoni from Colorado, 0.59 larvae, 4.47 nymphs by Carey et al. (1980); Clark et al. (1970), Grundmann and Frandsen (1960), Augustson (1941a), Douglas (1969), Hansen (1964), Johnson (1966), Hunter and Bishopp (1941), Sonenshine et al. (1976), Zwolak et al. (2013).

Dermacentor occidentalis by Coultrip et al. (1973), Bishopp and Trembley (1945), Holdenried et al. (1951), Lane et al. (1981), Mohr et al. (1964), Wyman and Schaefer (1972).

Dermacentor parumapertus by Beck et al. (1963), Gastfriend (1955), Johnson (1966).

Dermacentor sp. by Bacon et al. (1959), Coultrip et al. (1973).

Dermacentor variabilis by Campbell and MacKay (1979), Dodds et al. (1969), Garvie et al. (1978), Lawrence et al. (1965), Reeves et al. (2007), Whitaker et al. (1975).

Ixodes angustus by Allred et al. (1960), Beck, et al. (1963), Bishopp and Trembley (1945), Cooley and Kohls (1945), Douglas (1969), Easton and Goulding (1974), Fay and Rausch (1969), Johnson (1966), Lawrence et al. (1965), Reeves et al. (2007), Whitaker et al. (1975), Zwolak et al. (2013).

Ixodes cookei by Cooley and Kohls (1945).

Ixodes kingi by Allred et al. (1960), Beck et al. (1963), Johnson (1966), Sidwell et al. (1964).

Ixodes marmoratae by Allred et al. (1960).

Ixodes muris by Allred et al. (1960).

Ixodes ochotonae by Allred et al. (1960), Clark et al. (1970),

Johnson (1966).

Ixodes pacificus by Allred et al. (1960), Easton and Goulding (1974), Holdenried et al. (1951), Johnson (1966), Sidwell et al. (1964).

Ixodes peromysci by Cooley and Kohls (1945).

Ixodes sculptus by Bishopp and Trembley (1945).

Ixodes sp. by Allred et al. (1960), Coultrip et al. (1973), Hansen (1964), Holdenried et al. (1951), Scholten et al. (1962).

Ixodes spinipalpis by Allred et al. (1960), Beck (1955), Douglas (1969), Johnson (1966), Mohr et al. (1964).

Ixodes woodi from Texas by Eads et al. (1956).

Ornithodoros eremicus by Cooley and Kohls (1941).

Otobius sparnus by Johnson (1966), Kohls and Clifford (1963); Kohls et al. (1965) cited as *Ornithodoros sparnus*.

Diptera

Cuterebra americana complex by Grundmann and Frandsen (1960).

Cuterebra approximata by Smith (1975, 1977).

Cuterebra cyanella by Douglas (1969).

Cuterebra grisea from British Columbia by Hunter et al. (1972).

Cuterebra larvae from the Great Basin by Llewellyn (1978).

Cuterebra sp. by Blair (1942), Lawrence et al. (1965), Maurer and Skaley (1968), Scholten et al. (1962), Seaman and Nash (1976).

Fleas

Aetheca thamba (Jordan, 1929) by Holland (1944), Kinsella and Pattie (1967), Kinsella (1968), all cited as *Monopsyllus thambus*.

Aetheca wagneri Baker, 1904 from Bernalillo, Rio Arriba, and Sandoval County, New Mexico, by Ford et al. (2004); from Montana by Zwolak et al. (2013); from Utah by Stanford (1931) cited as *Ceratophyllus wagneri*.

Amalareus penicilliger (Grube, 1851) by Hubbard (1947), Jordan (1932), both cited as *Malaraeus penicilliger*.

Amaradix bitterrootensis Dunn and Parker, 1923 by Augustson (1941a), Hubbard (1947), Stark (1958), all cited as *Malaraeus bitterrootensis*.

Amaradix euphorbi (Rothschild, 1905) by Baker (1905), Beck and Allred (1966), Allred (1968), Egoscue (1966, 1976), Elzinga and Rees (1964), Haas et al. (1973), Hansen (1964), Holland (1949), Hubbard (1947), Morlan (1955), Senger (1966), Stark (1958), Tipton and Mendez (1968), Wagner (1936), Woods and Larson (1971), all cited as *Malaraeus euphorbi*; by Ford et al. (2004), Zwolak et al. (2013).

Amphipsylla sibirica (Wagner, 1898) by Allred (1968), Eads et al. (1979).

Anomiopsyllus amphibolus Wagner, 1936 by Barnes et al. (1977), Beck and Allred (1966), Egoscue (1976), Stark (1958).

- Anomiopsyllus falsicalifornicus* C. Fox 1929 by Coultrip et al. (1973).
- Anomiopsyllus hiemalis mexicanus* Holland, 1965 from Santa Fe County, New Mexico, by Ford et al. (2004).
- Anomiopsyllus novomexicanensis* Williams and Hoff, 1951 by Barnes et al. (1977); from Bernalillo and Hidalgo Counties, New Mexico, by Ford et al. (2004).
- Anomiopsyllus nudatus* (Baker, 1898) by Barnes et al. (1977), Haas et al. (1973), Stark (1958).
- Atyphloceras echis* Jordan and Rothschild, 1915 from Hidalgo, New Mexico, by Ford et al. (2004); by Egoscue (1976), Stark (1958).
- Atyphloceras multidentatus* (C. Fox, 1909) from Oregon by Easton (1983), Jameson and Brennan (1957), Rutledge et al. (1979), Stark (1958), Stark and Kinney (1969); by Holland (1949) as *A. artius* Jordan, 1933; by Hubbard (1947) as *A. felix* Jordan, 1933.
- Callistopsyllus terinus* Rothschild, 1905 from Santa Fe County, New Mexico, by Ford et al. (2004), Allred (1968), Egoscue (1976), Hansen (1964), Holland (1941, 1949), Hubbard (1947, 1949), Morlan (1955), Senger (1966); by Augustson (1941a), Beck (1966), Douglas (1969), and Stark and Kinney (1969) as *C. deuterus* Jordan, 1937.
- Carteretta carteri* Fox, 1927 by Holdenried et al. (1951), Hubbard (1947).
- Catallagia calisherii* Eads and Campos, 1979 by Eads and Campos (1979).
- Catallagia charlottensis* (Baker, 1898) by Baker (1905), Dunn and Parker (1923), Wagner (1936), and Hubbard (1947), who cites it both as *C. charlottensis* and as *C. motei* Hubbard, 1940.
- Catallagia decipiens* Rothschild, 1915 from Rio Arriba, Sandoval, Santa Fe County, New Mexico, by Ford et al. (2004); from Benton County, Washington, by O'Farrell (1975), Allred (1952), Allred (1968), Beck (1966), Douglas (1969), Egoscue (1966, 1976), Haas et al. (1973), Hansen (1964), Holland (1949), Hubbard (1947, 1949), Kinsella (1968), Morlan (1955), Zwolak et al. (2013).
- Catallagia mathesoni* Jameson, 1950 by Jameson and Brennan (1957), Nelson and Smith (1976), Stark and Kinney (1969).
- Catallagia sculleni* Hubbard 1940 by Hubbard (1947), Jameson and Brennan (1957), Nelson and Smith (1976), Poinar and Nelson (1973), Stark and Kinney (1969); from Oregon by Easton (1983), Holdenried et al. (1951) as *C. chamberlini* Hubbard, 1940; from California Augustson (1941b), both as *C. rutherfordi* and *C. vonbloekeri*.
- Cediopsylla inaequalis* (Baker, 1895) by Allred (1968).
- Ceratophyllus ciliatus* Baker, 1904 from Oregon by Easton (1983); by Holland (1941), Hubbard (1947), Jameson et al. (1957), all cited as *Monopsyllus ciliatus*.
- Ceratophyllus gallinae* (Schrank, 1803) by Reeves et al. (2007).
- Ceratophyllus pelecani* Augustson 1942 by Hubbard (1947).
- Conorhinopsylla nidicola* Jellison, 1945 by Poorbraugh and Gier (1961).
- Corrodopsylla curvata* Rothschild, 1915 by Hansen (1964); by Hubbard (1947) as *Doradopsylla jellisoni* Hubbard, 1940; by Robert (1962).
- Corypsylla jordani* Hubbard, 1940 by Hubbard (1947).
- Corypsylla ornata* C. Fox, 1908 by Hubbard (1947).
- Ctenophthalmus pseudagyrtis* Baker, 1904 by Benton and Krug (1956), Benton et al. (1969), Buckner (1964), Geary (1959), Holland (1949), Lawrence et al. (1965), Layne (1958), Main (1970), Poorbraugh and Gier (1961), Robert (1962), Scharf and Stewart (1980), Verts (1961), Whitaker and Corthum (1967), Whitaker et al. (1975), Woods and Larson (1971).
- Dasypsyllus gallinulae* (Dale, 1878), invasive species by Easton (1983).
- Delotelis hollandi* Smit, 1952 by Jameson and Brennan (1957).
- Delotelis telegoni* (Rothschild, 1905) by Augustson (1941a), Holland (1949), Hubbard (1947).
- Doradopsylla blarinae* C. Fox, 1914 from northern New York state by Benton et al. (1969).
- Doradopsylla jellison*, synonym of *Corrodopsylla curvata*.
- Echidnophaga gallinacea* (Westwood, 1875) by Beer et al. (1959), Hardy et al. (1974).
- Epitedia scapani* (Wagner, 1936) from California by Jameson and Brennan (1957); from Oregon by Easton (1983), Holland (1941, 1949), Hubbard (1947), cited as *E. jordani* Hubbard, 1940.
- Epitedia stanfordi* Traub, 1944 from Sandoval and Santa Fe Counties, New Mexico, by Ford et al. (2004); by Allred (1968), Beck (1966), Douglas (1969), Egoscue (1976), Elzinga and Rees (1964), Hubbard (1947), Morlan (1955), Stark (1958).
- Epitedia wenmanni* Rothschild, 1904 from Rio Arriba by Ford et al. (2004), Allred (1952), Allred (1968), Augustson (1941a), Beer et al. (1959), Benton and Krug (1956), Benton and Altmann (1964), Benton et al. (1969), Buckner (1964), Dunn and Parker (1923), Fox (1940), Geary (1959), Holland (1949), Hubbard (1947), Jameson and Brennan (1957), Lawrence et al. (1965), Layne (1958), Main (1970), Poorbraugh and Gier (1961), Rapp and Gates (1957), Reeves et al. (2007), Robert (1962), Scharf and Stewart (1980), Scholten et al. (1962), Schwan and Dobkin (1981), Stark (1958), Storm and Ritzi (2008), Tipton and Mendez (1968), Verts (1961), Ulrich and Vaughn (1963), Whitaker and Corthum (1967), Whitaker et al. (1975), Wilson (1957), Wyman and Schaefer (1972), Zwolak et al. (2013).
- Eumolpianus eumolpi* Rothschild, 1905 by Allred (1952), Allred (1968), Beck and Allred (1966), Haas et al. (1973), Hansen (1964), Hubbard (1947), Morlan (1955), Sidwell

- et al. (1964), Stark (1958), Stark and Kinney (1969), all citing it as *Monopsyllus eumolpi*. Also by Ford et al. (2004) from Sandoval County, New Mexico.
- Foxella ignota* (Baker, 1895) from Sandoval County, New Mexico, by Ford et al. (2004), Allred (1952), Allred (1968), Buckner and Blasko (1969), Hubbard (1947), Stark (1958). By Haas et al. (1973) cited as *Dactylopsylla ignota*.
- Hoplopsyllus anomalus* (Baker, 1904) by Hubbard (1941).
- Hystrichopsylla dippiei* Rothschild, 1902 from Sandoval County, New Mexico, by Ford et al. (2004), Beer et al. (1959), Buckner (1964), Egoscue (1976), Haas et al. (1973), Holland (1949), Scharf and Stewart (1980), Senger (1966), Stark (1958), while Allred (1952) and Hubbard (1947, 1949) cited as *H. gigas dippiei* (Baker, 1895).
- Hystrichopsylla occidentalis* Holland, 1949 from Oregon by Easton (1983); from Alaska, California, and Colorado by Campos and Stark (1979), Hubbard (1947); from Utah by Allred (1968). By Egoscue (1966, 1976) cited as *Hystrichopsylla linsdalei* Holland 1957.
- Leptopsylla segnis* (Schonherr, 1811) by Hardy et al. (1974).
- Malaraeus sinomus* (Jordan, 1925) from Bernalillo, Sandoval, and Santa Fe Counties, New Mexico, by Ford et al. (2004); from Utah by Stanford (1931), cited as *Ceratophyllus sinomus*; by Beck and Allred (1966), Beck (1966), Douglas (1969), Egoscue (1976), Haas et al. (1973), Hardy et al. (1974), Hubbard (1947, 1949), Morlan (1955), Stanford (1931), Sidwell et al. (1964), Stark (1958).
- Malareus telchinus* (Rothschild, 1905) from Rio Arriba, Sandoval, and Santa Fe Counties, New Mexico, by Ford et al. (2004); from Montana by Dunn and Parker (1923); from Fresno County, California, by Hubbard (1941); from Oregon by Easton (1983). By Allred (1952), Allred (1968), Beck and Allred (1966), Beck (1966), Coultrip et al. (1973), Douglas (1969), Dunn and Parker (1923), Egoscue (1976), Glicken and Schwab (1980), Haas et al. (1973), Hansen (1964), Hardy et al. (1974), Holdenried et al. (1951), Holland (1949), Hubbard (1947, 1949), Hubbard (1941), Jameson Jr. and Brennan (1957), Morlan (1955), Rutledge et al. (1979), Stark (1958), Stark and Kinney (1969), Wheldon (1941), Zwolak et al. (2013).
- Megabothris abantis* (Rothschild, 1905) from Rio Arriba and Sandoval Counties by Ford et al. (2004); from Oregon by Easton (1983). By Allred (1952); Augustson (1941a); Egoscue (1976); Haas et al. (1973); Hansen (1964); Holland (1949); Hubbard (1947), who also cites it as *M. adversus* (Wagner, 1936); Kinsella and Pattie (1967); Stark (1958); Zwolak et al. (2013).
- Megabothris asio* (Baker, 1904) by Holland (1949), Lawrence et al. (1965), Wilson (1961).
- Megabothris lucifer* (Rothschild, 1905) by Holland (1949).
- Megabothris quirini* (Rothschild, 1905) by Benton et al. (1969), Benton et al. (1971), Buckner (1964), Holland (1949), Lawrence et al. (1965), Robert (1962), Scharf and Stewart (1980).
- Megarhroglossus bisetis* Jordan and Rothschild, 1915 from Bernalillo and Sandoval Counties, New Mexico, by Ford et al. (2004), Williams and Hoff (1951).
- Megarhroglossus divisus* (Baker, 1898) from Bernalillo and Santa Fe Counties, New Mexico, by Ford et al. (2004). By Holland (1949), Kinsella and Pattie (1967), Morlan (1955).
- Megarhroglossus proculus* Jordan and Rothschild, 1915 by Augustson (1941a), Beck (1966), Douglas (1969), Egoscue (1976), Hubbard (1947), Jameson and Brennan (1957).
- Megarhroglossus smiti* Medez, 1956 by Egoscue (1976).
- Megarhroglossus weaveri* Eads and Campos, 1977 by Eads and Campos (1977).
- Meringis altipecten* Traub and Hoff, 1951 from Hidalgo County, New Mexico, by Ford et al. (2004).
- Meringis arachis* Jordan, 1929 from Hidalgo County, New Mexico, by Ford et al. (2004).
- Meringis bilsingi* Eads and Menzies, 1949 from Doña Ana, New Mexico, by Ford et al. (2004).
- Meringis cummingi* (C. Fox, 1926) by Coultrip et al. (1973), Hubbard (1947), Hardy et al. (1974).
- Meringis dipodomys* Kohls, 1938 by Egoscue (1976), Hubbard (1947), Stark (1958).
- Meringis hubbardi* Kohls, 1938 by Allred (1968), Egoscue (1966, 1976), Hansen (1964), Hubbard (1947).
- Meringis nidi* Williams and Hoff, 1951 from Santa Fe County, New Mexico, by Ford et al. (2004). By Morlan (1955).
- Meringis parkeri* Jordan, 1937 from Sandoval and Santa Fe Counties, New Mexico, by Ford et al. (2004). By Allred (1968), Beck and Allred (1966), Haas et al. (1973), Hansen (1964), Hardy et al. (1974), Hubbard (1947), Morlan (1955), Sidwell et al. (1964), Stark (1958), Stark and Kinney (1969), Wyman and Schaefer (1972).
- Meringis rectus* Morlan, 1953 from Santa Fe County, New Mexico, by Ford et al. (2004). By Morlan (1955).
- Meringis shannoni* (Jordan, 1929) from Benton County, Washington, by O'Farrell (1975). By Holland (1949), Hubbard (1947).
- Monopsyllus vison* (Baker, 1904) by Benton et al. (1969), Holland (1949).
- Monopsyllus wagneri* (Baker, 1904) from Benton County, Washington, by O'Farrell (1975); from Oregon by Easton (1983); from California by Poiner and Nelson (1973). By Allred (1952, 1968), Augustson (1941a), Beck and Allred (1966), Beck (1966), Beer et al. (1959), Brown (1944), Buckner (1964), Coultrip et al. (1973), Douglas (1969), Dunn and Parker (1923), Egoscue (1976), Elzinga and Rees (1964), Glicken and Schwab (1980), Haas et al. (1973), Hansen (1964), Hardy et al. (1974), Holdenried

- et al. (1951), Holdenried and Morlan (1955, 1956), Holland (1949), Hubbard (1947, 1949), Jameson and Brennan (1957), Jordan (1929), Kinsella and Pattie (1967), Kinsella (1968), Lawrence et al. (1965), Morlan (1955), Nelson and Smith (1976), Poinar and Nelson (1973), Rapp and Gates (1957), Rutledge et al. (1979), Schwan and Dobkin (1981), Sidwell et al. (1964), Stanford (1931), Stark (1958), Stark and Kinney (1969), Stark et al. (1976), Ulrich and Vaughn (1963), Verts (1961), Wagner (1936), Woods and Larson (1970), Wyman and Schaefer (1972).
- Nearctopsylla hamata* Holland and Jameson, 1949 by Jameson and Brennan (1957).
- Nearctopsylla princei* Holland and Jameson, 1949 by Jameson and Brennan (1957).
- Neopsylla inopina* Rothschild, 1915 by Hubbard (1949).
- Nosopsyllus fasciatus* (Bosc, 1800) by Allred (1952), Emmons et al. (1970), Holland (1949), Hubbard (1947), Stark (1958).
- Opisodasys keeni* (Baker, 1896) by Allred (1968), Augustson (1941a), Baker (1896, 1904), Coultrip et al. (1973), Easton (1983), Egoscue (1976), Glicken and Schwab (1980), Haas et al. (1980), Hansen (1964), Harvey (1907), Holland (1949), Hubbard (1947, 1949), Jellison (1929), Nelson and Smith (1976), O'Farrell (1975), Stark (1958), Stark and Kinney (1969), Wagner (1936), Zwolak et al. (2013).
- Opisodasys nesiotus* Augustson, 1941 by Augustson (1941b), Holdenried et al. (1951).
- Orchopeas caedens* (Jordan, 1925) by Hubbard (1947).
- Orchopeas howardi* (Baker, 1895) by Baker (1906), Benton et al. (1969), Fox (1940), Frandsen and Grundmann (1960), Geary (1959), Scharf and Stewart (1980), Stark (1958), Stewart (1933).
- Orchopeas leucopus* (Baker, 1904) by Beck (1966), Benton and Krug (1956), Benton and Altmann (1964), Benton et al. (1971), Brown (1944), Buckner (1964), Connor (1960), Douglas (1969), Egoscue (1976), Elzinga and Rees (1964), Fox (1940), Geary (1959), Haas et al. (1973), Holdenried and Morlan (1956), Holland (1949), Holland and Benton (1968), Hubbard (1947, 1949), Judd (1955), Lawrence et al. (1956), Layne (1958), Main (1970), Morlan (1955), Poorbaugh and Gier (1961), Rapp and Gates (1957), Reeves et al. (2007), Robert (1962), Scharf and Stewart (1980), Scholten et al. (1962), Stark (1958), Storm and Ritzi (2008), Verts (1961), Whitaker and Corthum (1967), Whitaker et al. (1975), Wilson (1961), Wyman and Schaefer (1972), Ford et al. (2004).
- Orchopeas neotomae* Augustson 1943 by Haas et al. (1973), Stark (1958), Ford et al. (2004).
- Orchopeas nepos* (Rothschild, 1905) by Augustson (1941a), Hubbard (1947).
- Orchopeas sexdentatus* (Baker, 1904) by Allred (1952), Allred (1968), Egoscue (1976), Hubbard (1947), Morlan (1955), Stark (1958), Ford et al. (2004).
- Oropsylla bruner* (Baker, 1895) by Benton et al. (1971) as *Opisocrostis bruneri*.
- Oropsylla idahoensis* (Baker, 1904) by Allred (1952), Hansen (1964), and Stark (1958).
- Oropsylla labis* (Jordan and Rothschild, 1922) by Allred (1968) as *Opisocrostis labis*.
- Oropsylla montana* (Baker, 1895) by Allred (1952), Beer et al. (1959), Hubbard (1947), Rutledge et al. (1979), Stark (1958), all cited as *Diamanus montanus*.
- Peromyscopsylla catatina* (Jordan, 1928) by Buckner and Blasko (1969), Lawrence et al. (1965), Main (1970), Reeves et al. (2007), Robert (1962), Scharf and Stewart (1980).
- Peromyscopsylla draco* Hopkins, 1951 by Morlan (1955), Ford et al. (2004).
- Peromyscopsylla ebrighti* (C. Fox, 1926) by Hubbard (1947), Hardy et al. (1974).
- Peromyscopsylla hamifer vigens* Jordan, 1937 from New Mexico by Haas et al. (1973), Ford et al. (2004); by Egoscue (1976).
- Peromyscopsylla hesperomys* (Baker, 1904) by Allred (1968), Augustson (1941a), Beck and Allred (1966), Beck (1966), Beer et al. (1959), Benton and Krug (1956), Benton and Altmann (1964), Douglas (1969), Easton (1983), Egoscue (1976), Fox (1940), Geary (1959), Haas et al. (1973), Holdenried et al. (1955), Holland (1949), Holland and Benton (1968), Hubbard (1947), Jameson and Brennan (1957), Kinsella (1968), Morlan (1955), Nelson and Smith (1976), Reeves et al. (2007), Scharf and Stewart (1980), Stark (1958), Wyman and Schaefer (1972), Ford et al. (2004), Zwolak et al. (2013). By Stanford (1931), cited as *Ctenopsyllus hesperomys*.
- Peromyscopsylla scotti* I. Fox, 1939 by Poorbaugh and Gier (1961), Reeves et al. (2007).
- Peromyscopsylla selenis* (Rothschild, 1906) by Easton (1983), Egoscue (1976), Haas et al. (1973), Holland (1949), Hubbard (1947), Kinsella and Pattie (1967), Rothschild (1906), Stark (1958), Stark and Kinney (1969), Stewart (1933), Wagner (1936), Ford et al. (2004), Zwolak et al. (2013). From Tennessee by Shaftesbury (1934), cited as *Ctenopsyllus selenis*.
- Phalacropsylla allos* Wagner, 1936 by Ford et al. (2004), Nelson and Smith (1976), Senger (1966), Stark and Kinney (1969).
- Phalacropsylla oregonensis* Lewis and Maser 1978 by Lewis and Maser (1978).
- Phalacropsylla paradisea* Rothschild, 1915 by Allred (1968).
- Phalacropsylla* sp. from Benton County, Washington, by O'Farrell (1975).
- Pleochaetis exilis* (Jordan, 1937) by Allred (1968), Stark (1958), both cited as *Monopsyllus exilis*.
- Plusaetis aztecus* Barrera, 1954 by Tipton and Mendez (1968), cited as *Pleochaetis aztecus*.

Plusaetis sibynus (Jordan, 1925) by Beer et al. (1959) and Hubbard (1947), Tipton and Mendez (1968), all cited as *Pleochaetis sibynus*.

Rhadinopsylla fraterna (Baker, 1895) by Holland (1949), Woods and Larson (1971), Zwolak et al. (2013). By Allred (1968) as *Rectofrontia fraterna*.

Rhadinopsylla goodi (Hubbard, 1941) by Elzinga and Rees (1964), Hubbard (1947).

Rhadinopsylla rauschi Holland, 1979 by Holland (1979).

Rhadinopsylla sectilis Jordan and Rothschild, 1923 by Allred (1968), Easton (1983), Egoscue (1966, 1976), Ford et al. (2004), Haas et al. (1973), Holland (1949), Hubbard (1947), Morlan (1955), Senger (1966), Stark (1958), Stark and Kinney (1969), Wagner (1936). Also by Dunn and Parker (1923), cited as *Micropsylla peromyscus*.

Stenistomera alpina (Baker, 1895) by Hubbard (1947), Egoscue (1976), Stark (1958).

Stenistomera hubbardi Egoscue 1968 by Egoscue (1968).

Stenistomera macrodactyla (Good, 1942) by Allred (1968), Beck (1966), Douglas (1969). By Stark (1958), cited as *Miochaeta macrodactyla*.

Stenoponia americana (Baker, 1899) by Eads et al. (1979), Ford et al. (2004), Haas et al. (1973), Holland (1949), Layne (1958), Poorbaugh and Gier (1961), Reeves et al. (2007), Scharf and Stewart (1980), Senger (1966), Whitaker and Corthum (1967), Whitaker et al. (1975).

Stenoponia ponera Traub and Johnson, 1952 by Beer et al. (1959).

Thrassis acamantis (Rothschild, 1905) by Hubbard (1947), Stark (1958).

Thrassis aridis Prince, 1944 by Morlan (1955), Stark (1958).

Thrassis augustsoni Hubbard, 1949 by Hardy et al. (1974).

Thrassis bacchi pansus (Jordan, 1925) by Ford et al. (2004), Morlan (1955), all cited as *Thrassis pansus*.

Thrassis campestris Prince, 1944 by Prince (1944), Ford et al. (2004).

Thrassis fatus (Jordan, 1925) by Schwan and Dobkin (1981).

Thrassis francisi (C. Fox, 1927) by Allred (1968), Stark (1958).

Thrassis pandorae Jellison, 1937 by Stark (1958).

Thrassis pansus (Jordan, 1925) by Ford et al. (2004), Morlan (1955).

Tunga monositus Barnes and Radovsky, 1969 by Barnes and Radovsky (1969), Camargo et al. (2017).

Acanthocephala

Moniliformis clarki in Pine County, Minnesota, by Erickson (1938a,b), reported by Van Cleave (1953); from Utah by Grundman (1959), Grundmann and Frandsen (1959, 1960), Grundman et al. (1961, 1976); Crook (1964), Crook and Grundmann (1964b), including life history; from California by McKeever (1963); from central and southern Rocky Mountains by Smith (1953); from Colo-

rado by Douglas (1969), Leiby (1961), Stock (1962); from Illinois by Barker et al. (1987).

Moniliformis sp., immature, from Nevada by Babero and Matthias (1967).

Nematodes

Ascaris lumbricoides, experimental infections of mice by Tiner (1953).

Aspicularia sp. from Colorado by Stock (1962).

Aspicularis americana from Minnesota by Erickson (1938a,b), Mathies (1958); from Montana by Zwolak et al. (2013).

Aspicularis tetraptera from *P. m. sonoriensis* from the southern arm of Great Salt Lake Desert in Utah by Grundmann (1957a), Grundmann and Frandsen (1960), Mathies (1958).

Baylisascaris procyonis, experimental infections in *P. leucopus*, *P. maniculatus*, *P. californicus*, and *P. polionotus* by Sapp et al. (2016a,b), Sapp et al. (2018). Logiudice (2001), Page (2013), and Page et al. (2001) point out that latrine foraging by two small mice allow transmission of *B. procyonis*.

Brevistriata skryabini from Utah by Frandsen and Grundmann (1961b).

Carolinensis carolinensis from Hidalgo, Mexico, by Pulido-Flores et al. (2005).

Capillaria americana by Read (1949a,b).

Capillaria gastrica from Hidalgo, Mexico, by Pulido-Flores et al. (2005).

Capillaria hepatica by Freeman (1958), Freeman and Wright (1960), Herman (1981), Lubinsky (1956, 1957), Wright (1961), Lubinsky et al. (1971), Rausch (1961), Layne (1968), Zenchak and Hall (1971); Solomon and Handley (1971). See also Layne and Griffo Jr. (1960), Stock (1962), Meagher (1998, 1999), Dalquest (1948). By Zwolak et al. (2013) cited as *Calodium hepaticum*.

Capillaria sp. from Quebec by Schad (1956); from Utah by Grundmann et al. (1961).

Filariid nematode larvae (*Filaroides martis*, *Perostrongylus pridhami*, or *Trilobostrongylus bioccai*) from Algonquin Park, Ontario, Canada, by Lankester and Anderson (1966).

Gongylonema mysciphilia from Utah by Frandsen and Grundmann (1961a), Grundmann et al. (1961).

Gongylonema peromysci from Nevada by Babero and Matthias (1967); from Arizona by Kruidenier and Peebles (1958).

Gongylonema sp. from Colorado by Hall (1912); from Utah by Kruidenier and Peebles (1957), Frandsen and Grundmann (1961b); from Arizona by Kruidenier and Peebles (1957).

Heligmosomoides polygyrus from California by Ehrenford (1954). Described as *H. p. bakeri* by Durette-Desset et

- al. (1972) but found not to be infective by Forrester and Neilson (1973); Forrester (1971) found it not to be infective to *P. maniculatus* after 16 years of passage in laboratory mice. Cable et al. (2006) reported molecular evidence that *H. polygyrus* from lab mice and wood mice are separate species. See also Behnke et al. (1991).
- Heligmosomoides vande-grifti* from Pennsylvania by Durette-Desset and Kinsella (2007); from Montana by Zwolak et al. (2013).
- Longistriata carolinensis* from Indiana by Dikmans (1935); from North Carolina by Durette-Desset (1974), who cited it as *Boreostrongylus carolinensis* (Dickmans, 1935) n. comb.
- Mastophorus dipodemi* from Sevilleta National Wildlife Refuge, New Mexico, unpublished (Arctos Database).
- Mastophorus muris* from Quebec by Schad (1954, 1956).
- Mastophorus numidica* from Utah by Crook and Grundmann (1964a); they reported *Eleodes tuberculata patruelis* as natural and experimentally infected intermediate hosts. From Colorado by Dyer and Olsen (1967a,b), who reported grasshoppers (*Melanoplus femurrubrum*), crickets (*Acheta domestica*), and beetles (*Eleodes obsoleta*) as intermediate hosts. Also from Colorado by Douglas (1969).
- Nematospiroides dubius* from Nevada by Babero and Matthias (1967); from near Davis, California, by Ehrenford (1954); life-cycle studies by Baker (1954), Cross (1960), Ehrenford (1954), and Cross and Duffy (1963); see also Behnke et al (1991); Yamaguti (1958–1963).
- Nippostrongylus brasiliensis* from Utah by Grundmann and Frandsen (1960); listed as a parasite of *P. maniculatus* by Erickson (1938a,b).
- Nippostrongylus muris* reported from deer mice by Porter (1935); from Utah by Grundmann and Frandsen (1960), Frandsen and Grundmann (1961b).
- Nippostrongylus* sp. from Idaho by Leiby (1962). Haley (1961) reported that Porter's (1935) attempt to infect *P. maniculatus* was not successful. Haley (1961) examined the specimens of Grundmann and Frandsen and indicated that they were not *N. brasiliensis*. Travassos and Darriba (1929) reported that *N. muris* (Yokogawa, 1920) was a synonym of *N. brasiliensis*.
- Parastrongylus schmidtii*, experimental infection by Kinsella (1987).
- Physaloptera* sp. larvae from Colorado by Dyer and Olsen (1967b); from Montana by Zwolak et al. (2013).
- Pterygodermatites peromysci* from Maryland, Virginia, Wisconsin, Georgia, and Florida by Lichtenfels (1970).
- Protospirura numidica* from Utah by Grundmann (1957a, 1957b), Healey and Grundmann (1974), Grundmann and Frandsen (1959, 1960), Frandsen and Grundmann (1961b), Grundmann et al. (1976), Grundmann and Warnock (1964), Crook (1964), Crook and Grundmann (1964a); from Colorado by Leiby (1961); from Idaho by Leiby (1962); from Montana by Zwolak et al. (2013). Life-cycle study by Crook and Grundmann (1964a) using *Eleodes tuberculata patruelis* as a natural intermediate host. Dyer and Olsen (1967) experimentally infected a cricket, *Acheta domestica* (L.); beetle, *Eleodes obsoleta* (Say); and grasshopper, *Melanoplus femurrubrum* (De-Geer). Quentin et al. (1968) established infections in the linear earwig, *Doru lineare* (Eschscholtz), and cockroach, *Periplaneta americana* (Linn.). Healey and Grundmann (1974) reported *Eleodes tuberculata*, *Melanoplus femurrubrum* and *M. atlanis*, and *Gryllus pennsylvanicus* as intermediate hosts.
- Protospirura peromysci* from Nevada by Babero and Matthias (1967); from Chanel Islands, California, by Smith and Carpenter (2006).
- Protospirura* sp. from Washington by O'Farrell (1975).
- Rictularia coloradensis* from Arizona by Kruidenier and Peebles (1957); from Colorado by Hall (1916), Stock (1962), Leiby (1961), Dyer and Olsen (1967b); from Colorado and Utah by Lichtenfels (1970); from Utah by Grundmann and Frandsen (1959, 1960), Grundmann et al. (1976), Grundmann and Warnock (1964); from Illinois by Barker et al. (1987); from Nevada by Babero and Matthias (1967); from Washington by Rankin (1945); from Idaho by Leiby (1962); from Wisconsin by Tiner (1948b); from Washington by Rankin (1945). *R. coloradensis* is a common parasite in northern New Mexico.
- Oswald (1958a,b), working with specimens obtained from *P. leucopus*, found that the larvae develop to the infective stage in Orthoptera, wood roaches (*Parcoblatta* spp.), and camel crickets (*Ceuthophilus* spp.), and all were natural intermediate hosts. He reported that in natural infections of *Peromyscus* 76.5% harbored *R. coloradensis*.
- Rictularia onychomys* from Nevada by Babero and Matthias (1967).
- Rictularia* sp. from Utah by Grundmann (1957a); from Washington by O'Farrell (1975).
- Strongylida lungworms. Encapsulated larvae in lungs from Algonquin Park, Ontario, Canada, by Lankester and Anderson (1966).
- Syphacia obvelata* from Washington by Rankin (1945); from Colorado by Douglas (1969).
- Syphacia peromysci* from Grand Canyon, Arizona; Sevilleta, New Mexico, unpublished (Arctos Database); from Wisconsin in *P. maniculatus bairdii* by Tiner (1948a), Tiner and Rausch (1950); from Quebec, Canada, by Schad (1956); from Utah by Grundmann (1957b, 1959), Grundmann and Frandsen (1959, 1960), Grundmann and Warnock (1964), Grundmann et al. (1976), Frandsen

and Grundmann (1961b), Kruidenier and Peebles (1957), Ogden (1971), Quentin and Kinsella (1972); from the Navajo Reservoir Basin, Colorado, and New Mexico by Stock (1961); from Arizona by Kruidenier and Peebles (1957); from Idaho by Leiby (1962); from Montana by Zwolak et al. (2013); from Hidalgo, Mexico, by Pulido-Flores et al. (2005); from Arkansas by McAllister et al. (2020).

Syphacia samorodini from Stanbury Mountains, Utah, by Grundmann (1957a); from Minnesota by Erickson (1938b); see also Kruidenier et al. (1961).

Syphacia spp. larvae from Lubbock County, Texas, by Rodenberg and Pence (1978).

Trichinella spiralis. None found in 472 animals from Mountain Lake, Virginia, by Solomon and Warner (1969). Experimental infections of *T. nativa* and *T. pseudospiralis* by Poirier (1994), Poirier et al. (1993). No infections from New Jersey by Leiby et al. (1988).

Trichuris muris from deer mice with prepatent period of 5 weeks by Worley et al. (1960); in the Channel Islands, California, by Smith and Carpenter (2006).

Trichuris perognatha from Utah by Grundmann and Frandsen (1960); from Colorado by Dyer and Olsen (1967b).

Trichuris sp. from Utah by Frandsen and Grundmann (1961a), Grundmann et al. (1961).

Trichuris stansburyi from Utah by Frandsen and Grundmann (1961a); from Colorado by Stock (1962).

Wellcomeia sp. from Washington by O'Farrell (1975).

Trematodes

Brachylaima (Postharmostomum) sexconvolutum from Ohio by Miller (1936).

Brachylaima sp. from Utah by Grundmann and Frandsen, (1959).

Brachylaima microti from Utah by Frandsen and Grundmann (1960, 1961b), Grundmann and Frandsen (1960); from Texas by Redetzke and Canaris (1977), Bristol and Canaris (1973).

Concinnum peromysci by Neidert and Macy (1968).

Euryhalmis pacificus from the northwest US by Senger and Macy (1952).

Metacercariae from Quebec, Canada, by Schad, (1956).

Postharmostomum helici from Quebec, Canada, by Schad (1956); experimental infection by Robinson (1949), Ulmer (1951).

Postharmostomum sexconvolutum listed by Yamaguti (1958–1963).

Quinqueserialis quinqueserialis could not be established in *P. maniculatus* by experimental infections, Kinsella (1971).

Schistosomatium douthitti, experimental infections by Short (1951, 1952); Schwanz (2006), Price (1931), Malek (1977).

Cestodes

Anoplocephala sp. from Colorado by Hall (1912).

Catenotaenia dendritica (*C. peromysci* according to Wolfgang (1956) from Quebec, Canada, Schad (1954); from Colorado by Leiby (1961); from Idaho by Leiby (1962).

Catenotaenia linsdaeli from Utah by Grundmann (1958), Grundmann and Frandsen (1959, 1960), Frandsen and Grundmann (1961b).

Catenotaenia peromysci from Coyote, Rio Arriba County, New Mexico, and from Colorado and Wyoming by Smith (1954); from Alberta, Canada, by Lubinsky (1957); from California by Voge (1955); from Utah by Grundmann et al. (1976), Bienek and Grundmann (1974); from Arkansas by McAllister et al. (2020). Cited by Hwang et al (2007), Hansen (1950).

Choanotaenia peromysci by Erickson (1938a,b), Hansen (1950) (syn. *Prochoanotaenia peromysci* Erickson 1938); from Alberta by Lubinsky (1957); from Colorado by Leiby (1961); from California by Voge (1955); from the southern Rocky Mountains by Smith (1954); from South Dakota by Ulrich and Vaughn (1963); from Illinois by Barker et al. (1987); from Montana by Zwolak et al. (2013).

Cladotaenia circi larvae from Utah by Grundmann and Frandsen (1959, 1960), Frandsen and Grundmann (1961b).

Cladotaenia globifera larva from Algonquin Park, Ontario, Canada, by Freeman and Wright (1960).

Cladotaenia sp. from Minnesota by Erickson (1938b).

Cysticercus sp. Skinner (1935).

Echinococcus multilocularis hydatid cyst from Minnesota by Carney and Leiby (1968); from North Dakota by Leiby (1965) and S. H. Richards, North Dakota Game and Fish Department, Bismarck (unpublished data) reported by Rausch (1967), Leiby et al. (1970), Leiby and Kritsky (1974). According to Jones and Pybus (2001), *P. maniculatus* is one of two main intermediate hosts for *E. multilocularis* in North America. Leiby and Kritsky (1974), Kritsky and Leiby (1975), from Minnesota and Winnipeg, Manitoba, Canada, by Leiby et al. (1969), Lee (1969); from Manitoba by Lubinsky et al. (1971); from Montana by Feigley and Worley (1988); from Alberta, Canada, by Holmes et al. (1971), Chalmers and Barrett (1974); from New Mexico by Botero-Canola et al. (2019). Rausch and Richards (1971) feeding experiments show that meadow voles are more susceptible than deer mice. Summary of life cycles in north-central US by Leiby and Kritsky (1972). Ecology and distribution in Wells County, North Dakota, by Ohbayashi et al. (1971). Jacobsen (1968) reported no infections in *P. maniculatus* from grain fields around the Winnipeg, Manitoba, vicinity, but it was present around the Truax Mine in the same area by Leiby et al. (1969).

Echinococcus sibiricensis from St. Lawrence Island, Alaska, by Rausch and Schiller (1954), who indicate a single specimen of *Peromyscus* sp. was infected, but rodents of this genus appear to be relatively refractory (Rausch and Schiller, 1954). Subsequent work shows a new biotype of *E. multilocularis* may be in the lower 48 states (Botero et al., 2019).

Hydatigera lynx by Skinner (1935) from Virginia, by Holloway (1963).

Hymenolepis bennetti from Ontario by Freeman (1960); from Illinois by Barker et al. (1987).

Hymenolepis citelli from Utah by Crook (1964), Grundmann and Frandsen (1959, 1960); Frandsen and Grundmann (1961b), Grundmann et al. (1976), Cook (1964); some host resistance was reported by Wassom et al. (1973, 1974, 1986).

Hymenolepis diminuta from Northrup Canyon, Washington, by Rankin (1945).

Hymenolepis fraterna, experimental infection by Hunninen (1935).

Hymenolepis peromysci by Tinkle (1972) in *P. boylii* and also in *P. maniculatus* from California. Tinkle reported that stink beetles *Eleodes armata* LeConte and *E. dentipes* Eschscholtz were intermediate hosts. Growth and development in hamsters by Stallard and Arai (1978).

Hymenolepis sp. cysticercoid from Idaho by Leiby (1962); from Nevada by Babero and Matthias (1967).

Hymenolepis sp. from West Virginia by Zenchak and Hall (1971); from Nevada by Babero and Matthias (1967); from Minnesota by Erickson (1938a,b), Hansen (1950); from Nebraska by Hansen (1950); from Montana by Zwolak et al. (2013).

Mesocestoides carnivoriculus tetrathyridia from Utah by Grundmann (1956, 1957a, 1958), Grundmann and Frandsen (1959, 1960); Frandsen and Grundmann (1961b).

Mesocestoides tetrathyridia from Taos County, New Mexico, by Ubelaker et al. (2014); from Coos County, Oregon, by Kegley et al. (1970); from Barkley Sound, British Columbia, by Herman (1981).

Paranoplocephala sp. from Utah by Grundmann and Frandsen (1959, 1960).

Paruterina candelabraria plerocercoid from Canada by Baron (1971); from Utah by Grundmann and Frandsen (1959); Frandsen and Grundmann (1961b); from Wisconsin with life cycle by Rausch (1949).

Paruterina rauschi plerocercoid in liver from West Virginia by Zenchak and Hall (1971); from Algonquin Park, Ontario, Canada, by Freeman and Wright (1960).

Prochoanotaenia sp. by Erickson (1938a, b).

Taenia mustelae cysticercus in liver and lungs from West Virginia by Zenchak and Hall (1971); from Ontario by

Freeman (1956); from Algonquin Park, Ontario, Canada, by Freeman and Wright (1960).

Taenia ovis from Quebec and the coast of Labrador by Schad (1954).

Taenia rileyi by Riser (1956).

Taenia sp. from Hidalgo, Mexico, by Pulido-Flores et al. (2005).

Taenia taeniaeformis from California by Theis and Schwab (1992).

Taenia tenuicollis (= *T. hydatigena*) cysticercus from Montana and Oregon by Locker (1955); from Quebec by Schad (1956).

Other parasites carried by Peromyscus

Clostridium botulinum, which results in botulism. Botulism type 3 is found in aquatic birds and is known to infect mice in laboratory conditions.

Mice, including *Peromyscus* spp., can also serve as carriers of parasitic organisms of other animals. Davidson and Nettles (1988) report that mice can serve to carry these parasites from other animals.

Pseudorabies Aujeszky's disease caused by a herpesvirus in swine and cattle, sheep, horses, dogs, cats, foxes, raccoons, skunks, rats, and mice.

Stomach worms *Gnathostoma procyonis* and *Physaloptera rara* and larvae from crickets can be stored in mice and later transmitted to raccoons when they prey on mice.

Toxoplasma gondii, which results in toxoplasmosis. Experimental infections in mice suggest mice can carry the protozoan and allow transmission to cats or other wild or domestic felines.

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Peromyscus maniculatus. National Park Service photo by John Good.